THE SPREAD OF MYXOMATOSIS IN THE NETHERLANDS

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Introduction :

The wild rabbit is found practically throughout the Netherlands except in some grassland districts (polders) and districts with much water. Being an injurious animal, it comes within the scope of the Game Act, and as game it is greatly appreciated by shooters. Agricultural, sylvicultural and horticultural communities on the other hand object to an excessive number of this species in view of the damage it causes to the crops. Consequently the myxomatosis is greatly regretted by shooters and many persons engaged in the protection of natural scenery (because the number of animals that are hunted and killed by birds and beast of prey is reduced now), while on the other hand the land users often consider the disease a godsend.

There have been no measures on the part of the Government to promote the spread of myxomatosis even in the slightest degree. Generally speaking, the people consider it a horrible disease and take pity on the animals. After wild rabbits had been intentionally infected with this virus in France in June 1952, it was not before September 9th, 1953 that the disease was diagnosed in this country, in fact on tame rabbits near Noordwijk, around the centre of the Netherlands near the North Sea Coast. At about the same time myxomatosis was also reported on the island of Walcheren again in tame rabbits.

Only a few days later, on the 14th September 1953, the disease was also reported near Flushing, in South Walcheren, this time in wild animals.

In consultation with the Veterinary Service, the

Department of Wildlife Management immediately sent a circular to all burgomasters requesting them to report new cases at once.

The situation at the end of February 1956.

Reports were received from various parts of the country and the following summary may serve to illustrate the present situation (February 1956) .

The disease prevails :

1. In the dune districts on the coast and in Texel, the southernmost of the Frisian (Wadden) Islands.

2. In certain districts in the southern part of the country (in the province of North-Brabant and Limburg).

3. Throughout a large area in the middle and east of the country.

No reference is made here to the smaller isolated areas. The parts of the country where so far the disease has not penetrated at all are :

1) Friesland, Groningen and Drente, the three northern provinces.

2) The Frisian Islands, except Texel, the southernmost island.

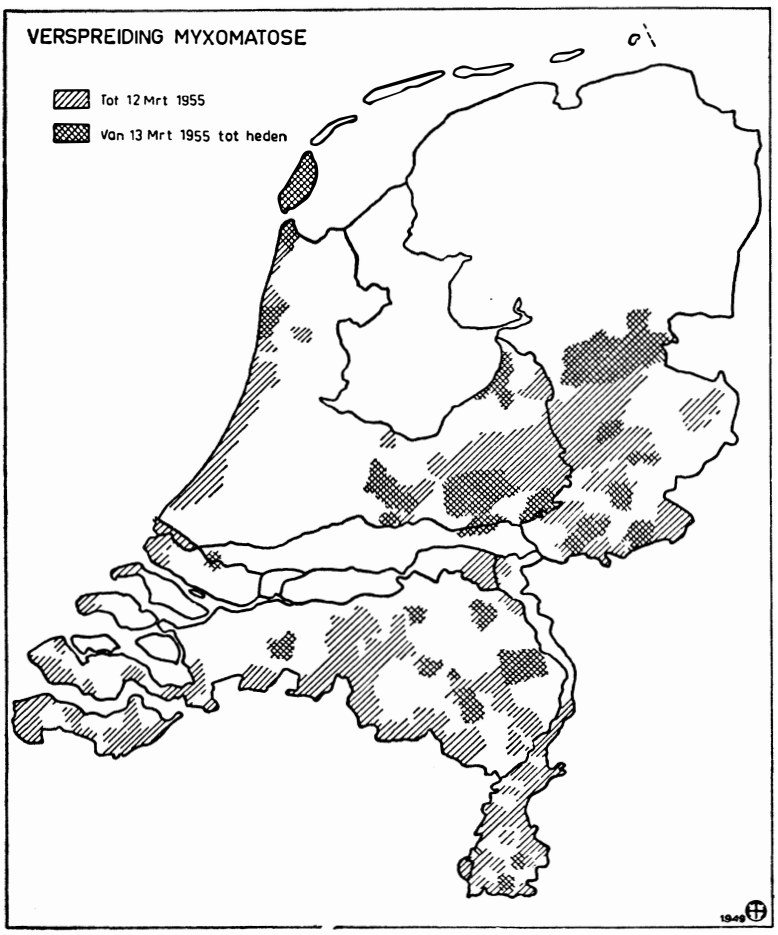
It may be observed that new reports still come in, though slowly, but it is a striking fact that these reports invariably come from places bordering those already infected.

At about the same date myxomatosis was also reported on the island of Walcheren, again in tame rabbits. There are indications that — at least for the time being, — the above mentioned parts of the country, which have been free from myxomatosis so far, will remain free from it.

The speed at which and the direction in which the disease spread.

So, the first case of myxomatosis in wild rabbits (reported on September 14th 1953) was found on the island of Walcheren in the province of Zeeland, and the disease may have been brought on by tame rabbits. In the next few weeks reports were received from the Belgian border (Deurne) and an area near the German border (Porterholt), east of the Meuse. So the disease penetrated the Netherlands from two sides, from Germany and from Belgium, and then gradually spread.

An outbreak was also reported in the centre of the



The spread of Myxomatosis in the Netherlands

Netherlands (at Ede) as early as at the beginning of October 1953, but the disease was not officially diagnosed by the Veterinary Service, and very recently it was once more reported by the same municipality, so that it is very doubtful whether the first observation was right. This doubtfulness is accentuated by the fact that municipalities in the same area did not report any cases of myxomatosis until much later (Brummen, Sept. 54).

So the nidus in the middle of the country probably did not develop until the autumn of 1954. It is a remarkable fact that the first reports were not received from the municipalities on the German border, but from those situated east and west of the Ijssel at a distance of about 40 km from this border (Brummen, September 1954).

The dunes on the sea coast, where on the whole the rabbit population is most dense, shows a curious pattern of spreading. It has been observed in the above that on 14th September 1953 the first cases were discovered at Flushing. On the mainland south of the Wester-Schelde, at a distance from Flushing of more than 5 km across this arm of the sea (at Cadzand), diseased animals were not found until February 4th 1954. It is unlikely that the disease penetrated here from the south, from Belgium therefore, because south of Cadzand separate centres of outbreaks did not develop until later.

A few days later (on 12th February 1954) myxomatosis was reported in the north of the island of Walcheren (Vrouwenpolder). So, probably, the dunes between this part of the island and Flushing were not infected then, though later they were.

Next, on July 10th 1954, a serious outbreak was reported in the dunes west of the town of Leyden. This is curious in a way, because it was in this district that myxomatosis was first reported in tame rabbits on September 9, 1953, nearly one year before.

Already in November 1953 myxomatosis was diagnosed on the island of Schouwen north of the above-mentioned island of Walcheren. At first the disease was found sporadically there, but in the latter part of the summer and in the autumn of 1954 the epizootic was very serious. A period of about six months elapsed between the appearance of myxomatosis in the north of Walcheren and that on the island of Schouwen. The two districts are separated by an arm of sea about 15 km. wide. Gradually myxomatosis spread over the other dune districts and went on to the island of Texel in the

north (September 1955), but so far it has not reached the other islands there.

The course of the disease in the various seasons.

In the Netherlands, myxomatosis seems to spread most quickly in the latter part of summer and in autumn, as the following figures show :

1954

Jan.	Feb.	Mar.	April	May	June
1	2	—	—	3	—
July	Aug.	Sep.	Oct.	Nov.	Dec.
2	5	18	18	13	8

The figures refer to the number of reports on new outbreaks in new places.

Natural barriers.

In a country like the Netherlands with its large rivers from east to west it might be expected that these rivers would be a natural barrier checking the spread of the disease, at least temporarily. There is no evidence of this at all. Large areas, the polders more particularly, usually provide no suitable biotope for the rabbit and accordingly they are hardly found there if at all. Even such areas do not check the spread of the disease, as the accompanying map shows. The distance between the southern part of the country (the Belgian border) and the infected areas in the middle of the country was covered in only one year (September 1953, Deurne, September 1954, Brummen, see the above).

Signs of recovery in the rabbit population.

Signs of recovery in the rabbit population can be found in some places. In other districts the rabbit has become and still is a rare species. According to a superficial impression a rabbit population, though a sparse one, has survived in the south and in the middle of the Netherlands. Moreover there is the possibility that sportsmen have released rabbits here and there, though there is no official evidence that this has been done.

In the Netherlands no cases are known of myxomatosis among hares, as there seems to be elsewhere. Neither are there any reports about rabbits having recovered from this disease.

Places of resistance.

It is very striking indeed, that in the districts where myxomatosis has raged certain parts of the infected places remained free from the disease. So far these enclaves have not been infected.

The influence of myxomatosis on the number of predators and on their behaviour.

It might be expected that the elimination of the rabbit, one of the principal preys of predators (mammals and birds), would have an influence on the behaviour and the number of those. Curiously enough not much is known of such an influence. There are no indications of birds of prey migrating to other places, nor of birds or mammalian predators now attacking other animal species, either domestic or wild.

General observations.

No further investigation has been carried out in the Netherlands into the question of how the rabbits were infected. There is no conclusive evidence about cases of intentional infection through the deliberate transfer from one district to another of diseased animals or dead bodies, though, naturally, it is possible that this has been done, because these animals are a nuisance to many land-users.

The various theories abroad that mosquitoes, fleas, etc. have transmitted the disease, whether or not supported by evidence, also apply to the Netherlands of course.

Summary.

Myxomatosis in the Netherlands was first discovered at Noordwick, west of Leyden, in tame rabbits (September 9, 1953). On 14th September, 1953 the disease was first observed in wild rabbits on the island of Walcheren. The disease gradually penetrated the Netherlands from the south (Belgium) and from the east (Germany). At present, there are three large areas where myxomatosis prevails :

1. The dune districts on the sea coast. It should be observed here that so far the disease has not reached the Frisian islands, except Texel, the southernmost of these islands.

2. South of the large rivers, where it prevails in several countinuous areas.

3. In a practically continuous area in the middle of the country, north of the large rivers.

The disease has not reached :

1. A large area in the northern part of the country, namely the provinces of Friesland, Groningen and Drente, and

2. The Frisian islands, except Texel, the southernmost of these islands.

It seems that the months of September, October and November provide the most favourable conditions for the disease to spread, as regards the number of new cases within a centre that has already developed, as well as the development of new centres.

No investigations have been carried out in the Netherlands into the question of how the disease has been transmitted. There is no conclusive evidence that the animals have been deliberately infected.

No cases are known of myxomatosis among hares.

Cases have been observed of a new gradual increase in the rabbit population in areas where the disease has prevailed.

Cases have also been observed where the disease prevailed for some months, though later on it disappeared without having exterminated the entire rabbit population. However, in such cases the percentage of survival was low (between 1-5 %).

Experience has shown, however, that in places with a fairly large or a large rabbit population myxomatosis rages violently and often reduces the number of animals considerably within a short time, whereas in shooting grounds with a very moderate or a moderate rabbit population the disease gradually develops and lingers on for a long time. The impression is justified that in these places the percentage of survival is higher. So, as far as infection is concerned, direct contact between the animals could be a very important factor.

Small localities have been found where myxomatosis had not penetrated, though they were situated in infected areas.

There is no conclusive evidence of any change in the behaviour of birds and beast of prey.

RESUME

En Hollande, la myxomatose a été observée pour la première fois à Noordwijck, à l'ouest de Leyden sur les lapins domestiques (9 septembre 1953). Le 14 septembre 1953 la maladie est découverte pour la première fois chez les lapins de garenne dans l'île de Wal-

cheren. La myxomatose se répandit petit à petit en Hollande venant du sud (Belgique) et de l'est (Allemagne). Actuellement il y a trois grandes zones où elle sévit :

1) La région des dunes au bord de la mer. Il faut noter que jusqu'à présent, la maladie n'a pas atteint les îles frisonnes, sauf Texel située plus au sud.

2) Au sud des grands fleuves, où elle règne dans plusieurs régions.

3) Sur une aire pratiquement continue au centre du pays, au nord des grands fleuves.

La myxomatose n'a pas atteint :

1) Une grande surface dans la partie nord du pays, notamment les provinces de Frise, Groningen et Drente.

2) Les îles frisonnes, excepté Texel, la plus méridionale de ces îles.

Il semble que les mois de septembre, d'octobre et de novembre offrent les conditions les plus favorables à la propagation de la maladie, soit pour la multiplication des cas dans un centre où elle existe déjà, soit pour le développement de nouveaux foyers d'infection.

Aucune enquête n'a été faite sur la manière dont le virus s'est transmis aux Pays-Bas. Il n'y a pas de preuve concluante que les animaux aient été délibérément infectés par la population.

On ne connaît pas de cas de myxomatose parmi les lièvres.

On a observé des cas de reconstitution progressive de la population des lapins dans des régions où l'épidémie avait sévi.

D'autres cas ont aussi été notés où la myxomatose se manifesta pendant quelques mois et disparut plus tard sans avoir entièrement exterminé les lapins. Cependant, dans ces cas-là, le pourcentage de survivants était bas (entre 1 et 5 %). L'expérience a prouvé que dans les régions à forte densité de population de lapins, la myxomatose faisait rage et réduisait souvent considérablement le nombre des animaux en très peu de temps; au contraire, là où la population était peu dense, l'épidémie s'installe graduellement et traîne longtemps. L'impression que, dans ces régions, le pourcentage des survivants est élevé, est donc justifiée. En ce qui concerne l'infection, le contact direct entre animaux pourrait être un facteur important. Au milieu des zones infectées il est resté quelques îlots intacts. Le comportement des prédateurs de lapins, oiseaux ou mammifères, ne s'est pas modifié jusqu'ici.